

ChemRisk/Shonka Research Associates, Inc., Document Request Form

(This section to be completed by subcontractor requesting document)Requestor T. Bennett / 1034A
Document Center (is requested to provide the following document)Date of request 9/14/95 Expected receipt of document 10/14/95Document number KP-1022 Date of document 6/4/56Title and author (if document is unnumbered)

_____**(This section to be completed by Document Center)**

Date request received _____

Date submitted to ADC 10/17/95

Date submitted to HSA Coordinator _____

(This section to be completed by HSA Coordinator)Date submitted to CICO 10/17/95Date received from CICO 10/20/95Date submitted to ChemRisk/Shonka and DOE 11/1/95**(This section to be completed by ChemRisk/Shonka Research Associates, Inc.)**

Date document received _____

Signature _____

UNCLASSIFIED

SECRET

This document consists of 2
Pages No. 2 of 6 copies, Series A

INTER-COMPANY CORRESPONDENCE

UNION CARBIDE NUCLEAR COMPANY

A Division of Union Carbide and Carbon Corporation

273487

To: Dr. H. F. Henry
K-1001

PLANT RECORDS
RECEIPT NO.

W 42809

Plant: Oak Ridge Gaseous Diffusion

Date: June 4, 1956

Subject: K-311-1 Purge Gas Recovery

KP-1022

INVENTORIED

10/70

By

Copies To: Mr. R. H. Dyer ✓
Mr. J. A. Parsons
Mr. H. M. Preuss
Mr. M. F. Schwenn
Mr. H. G. P. Snyder

In response to a request by your group for further information pertaining to UF₆ tops concentration control, the following is offered as supplemental information to KP-989.

1. AGA Controls and Alarms

Stage 5 of the first low speed cell located below the high speed cells is normally monitored by one or two AGA elements. Lights are returned to stage 4 of the top low speed cell from the discharge of the tops booster pumps through the concentration recycle line by a control valve in the concentration recycle line, which is opened or closed by a Triact controller receiving the output of an AGA to maintain a lights concentration of 89.5%. An increase above 88.9% nitrogen or a decrease of lights below 88.0% as recorded by either of the AGA's actuates an audible and visible alarm. Excess lights are automatically purged by the closing of the concentration recycle control valve or by manual control through a larger control valve and orifice. An increase of UF₆ concentration as shown by the AGA would automatically be decreased by the opening of the concentration recycle valve to allow a greater volume of lights to flow back to the top low speed cell. In case of failure of both AGA's, the purge is controlled manually.

2. Space Recorder Controls and Alarms

The concentration of UF₆ in the tops purge is monitored by a space recorder. Normally this concentration averages less than 0.0001 mol per cent UF₆. If the concentration reaches 0.0026 mol per cent UF₆, and the selector switch is turned to "automatic," an audible and visible alarm is actuated and a motor operated valve (2-LP-15) closes to prevent further purging to the stack. This operation also tends to diminish the concentration of UF₆ in the high speed cells. As described in KP-989, a new motor operated valve (2-LP-16) to be installed in the line to K-1131 will also close when the concentration of UF₆ reaches the set point of the space recorder.

RESTRICTED DATA

This document contains restricted data as defined in the Atomic Energy Act of 1954. Its transmittal or the disclosure of its contents in any manner to an unauthorized person is prohibited.

EXCLUDED FROM AUTOMATIC DOWNGRADING AND DECLASSIFICATION.

This form for Inter-Company Correspondence only

SECRET

UNCLASSIFIED

This document has been approved for release to the public by:

Signature: [Signature]
Date: 10/22/95
Technical Information Officer
Oak Ridge K-25 Site

Union Carbide Nuclear Company, Oak Ridge Gaseous Diffusion Plant, Operating Contractor for the U.S. Atomic Energy Commission.

DOE-OR QA
George Thoenig
DOE
Date

KP 1022 2 A



KP 1022 2 A

Classification changed to: UNCLASSIFIED

(level and category)

CC 100-4

(classification guide)

8/11/94

Date

8/31/94

Date

ADC or ADD signature (first reviewer)

Sam W. Wolfport

ADC signature (final reviewer)

7/26/95

WCX-163 (8-55)

Dr. H. F. Henry

-2-

June 4, 1956

3. Motor Load Alarms and Trip Relays

The 1B motor and cell motor loads of each high speed cell are shown by separate indicating ammeters at the cell boards and the graphic panel. Cells 4, 6, and 8 normally have 1B operating motor loads of approximately 75, 80, and 100 amps respectively, and the overload alarms are set at 90 amps on cell 4, and 125 amps on cells 6 and 8. Cell overload trip relays actuated by 1B motor currents are set at 160 amps on cell 4 and 180 amps on cells 6 and 8. Total cell motor loads on cells 4, 6, and 8 normally are about 580, 850, and 1,000 amps respectively. The alarm settings are 720 amps on the cell 4 north group, 720 amps on the cell 4 south group, 1400 amps on cell 6, and 1100 amps on cell 8. Cell overload trip relays actuated by total cell currents are set at 1200 amps for the north and south group motors of cell 4, 2400 amps for cell 6 and 2000 amps for cell 8.

The first indication of a possible increase in UF₆ tops concentration is an increase on the 1B motor load of the first high speed cell⁽¹⁾, which alarms at 125 amps. In addition, a general unit alarm would be sounded by the AGA, since the breakpoint concentration would necessarily be disturbed in excess of 20.5% to cause a noticeable change in tops concentration. In the event the 1B motor current of the first high speed cell reaches 150 amps, procedure calls for the top purge valve to be closed, thereby preventing any further UF₆ upflow. In the event of an actual increase in tops concentration, the space recorder (normally operated on the top boosters) would automatically close off the top purge valve (2-LP-15) at a UF₆ concentration of 26 ppm (under normal sensitivity and background conditions), thereby preventing any further UF₆ upflow and purging. Space recorder and AGA indications also are slaved to the CCR where provisions for purge cut-off (and unit isolation) also exist.



H. M. Preuss
Area II

HMP:DCAJ:fs

(1) KP-1017, "Effect of Change in Process Gas Concentration on Load and ΔT of a Size 38 High Speed Compressor", R. D. Shaffer.